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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/330,154	06/11/1999	SUSUMU GOTO	862.2866	9061

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EXAMINER

VANORE, DAVID A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/330,154

Applicant(s)

GOTO, SUSUMU

Examiner

David A Vanore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-15 and 17-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-15 and 17-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 May 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Allowable Subject Matter***

Prosecution on the merits of this application is reopened on claims 1, 3-15, and 17-45 considered unpatentable for the reasons indicated below:

Applicant has amended the independent claims and introduced new claims 42-45 containing the limitation "changing a distribution of an axial magnetic field generated by said magnetic lens". After consideration of the new limitation and claims, the examiner has concluded that the claims as presented are not allowable over the prior art of record.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Note: See attachment at end of Office Action for details regarding recent changes to 35 USC 102 (e).

Claims 1-11, 15-25, and 29-45 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Terashima et al.

Terashima et al. teaches the following :

A charged particle source (Fig. 19 Item IL), an irradiation system for producing an arcuate shaped beam and irradiating said beam onto a mask (Fig. 19 Item IL), a

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projection optical system comprising a plurality of magnets (Fig. 19 Item 1008, 1010, and 1013), an acquisition means (Fig. 25 Item 1040) which determines image information for correction (Col. 21 Lines 38-61), and a controller to control the currents distributed to the magnets (Fig. 14 Item 40) where the control system comprises an aberration correction system and control circuit (1007 and 1034), a magnification system and control circuit (1008 and 1036), and a focus correction system (1013) coupled to an optical characteristic system (1037) as recited in claims 1-8, 15-25, and 29-45, where the control system and projection optical system adjust the optical characteristics of the beam and to correct any aberrations in the beams (Col. 13 Lines 35-45 and Col. 20 Line 32-59). Regarding the newly added limitation "where a controller changes a distribution of an axial magnetic field", in order to correct focus, magnification, and aberration, it is necessary that a distribution of an axial magnetic field be changed. Furthermore, image distortion is corrected by adjusting the focus and rotation of the beam and is accomplished by control circuit (1037).

An acquisition system which comprises a mask (Fig. 25 Item 1006) which passes a predetermined beam portion and a measurement system which correlates the position of the wafer (Fig. 25 item 1016) and the mask to determine the and correct a pattern image projected on the wafer (Col. 21 Lines 38-61) as recited in claims 9-11.

Regarding the newly added feature in claim 35 of a moving amount of the second principal plane is equal to a value obtained by multiplying a moving amount of the first principal plane by a magnification of a projection optical system while a moving direction

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of the first principal plane is the opposite direction to that of the second principal plane is not taught by Terashima et al. However, this feature was not claimed previously.

Regardless, this is the intended use of an apparatus having the configuration of Terashima et al. and furthermore is an inherent feature of any optical system where a first optical system produces an object plane downstream of another magnifying system. In Terashima et al. for instance, the image produced downstream of reduction optical system 108 at or after lens 113 will move in accordance with a change in the settings of lenses 108a and 108b, necessarily. However, the motion of the image produced at or beyond lens 119 is multiplied by any magnification factor imparted by lens 113.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-13 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima et al. in view of Sakamoto et al.

Regarding claims 12-13, and 26-27, Terashima et al. teaches all limitations as applied above but fails to teach an acquisition system with a substrate having a mark, a measurement unit to detect backscattered electrons, and a substrate stage which moves such that the position of the mark moves across the position where the charged particle beam becomes incident on the substrate stage.

Sakamoto et al. teaches a charged particle lithography apparatus comprising a mark (15, 17) composed of heavy metal (Col. 10 Lines 39-68), a backscattered electron detector, and a scanning stage which scans the position of the mark and determines the incident position of the charge particle beam by correlating the detected backscattered electrons with the stage position (Col. 5 Lines 30-44).

Sakamoto et al. modifies Terashima et al. to produce a charged particle lithography device with a backscattered electron detection and aligning means.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a backscattered electron detection and aligning means because Sakamoto et al. demonstrates that the incorporation of such a means in a charged particle lithography device is well known in the art.

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terashima et al. and Sakamoto et al. as applied above, and in further view of Mori et al.

Terashima et al. and Sakamoto et al. teach all limitations as applied above but fail to teach marks on a substrate shaped as a crisscross or composed of a heavy metal.

Mori et al. teaches a charged particle lithography apparatus comprising alignment marks (M1) in the shape of a crisscross and composed of heavy metal.

Mori et al. modifies Terashima et al. and Sakamoto et al. to produce a charged particle lithography apparatus having alignment marks on a wafer in the shape of a crisscross and composed of a heavy metal.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide alignment marks in the shape of a crisscross and composed of heavy metal on a substrate in a charged particle lithography apparatus because Mori et al. teaches that such a modification provides the necessary accurate alignment between a mask and semiconductor wafer (Col. 1 Lines 7-12).

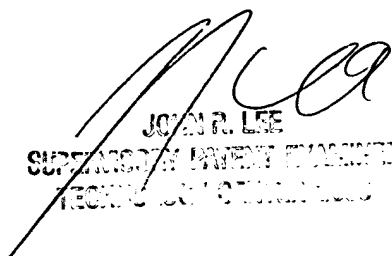
### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Vanore whose telephone number is (571) 272-2483. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dav

  
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